SAFETY DATA SHEET

DATE: MAY 27, 2015

1. PRODUCT AND COMPANY IDENTIFICATION

Product Name Inflatable Life Preservers, Life Vests, Life Jackets, Individual Flotation Devices, Personal Flotation Devices.

Trade Names

Model	Part No.	Model	Part No.	Model	Part No.
GA-12	P0201-( )	KSD-35L8	P0723-( )	Triumph Sportsman	P01049-( )
CHD-25L8	P0620-( )	KSE-35L8	P0723E( )	Triumph II *	P01080-( )
IN-V20L8	P0640-( )	Triumph I *	P01037-( )	Pronto *	P01130-( )
XF-35	P01074-( )	Bravo	P01190-( )	KSD-35-( )	P0723-( )-( )
UXF-35	P01202-( )	Titan-XF	P01253-( )	AIC-35	P01400-( )

* Water activated inflation available on these models only.

Company Eastern Aero Marine
5502 NW 37th Avenue
Miami, Florida 33142

Telephone (800) 255-3924
Fax (305) 637-8632
Emergency Phone Number (813) 248-0585

2. HAZARDS IDENTIFICATION

- Carbon Dioxide, Compressed

Symbol(s) or pictogram(s) Refer to supplier's Safety Data Sheets for specific information on component.

Hazard statement(s) Refer to supplier's Safety Data Sheets for specific information on component.

Precautionary statement(s) Refer to supplier's Safety Data Sheets for specific information on component.

Hazards not otherwise classified Refer to supplier's Safety Data Sheets for specific information on component.

3. COMPOSITION/INFORMATION ON INGREDIENTS

N/A. Refer to supplier's Safety Data Sheets for specific information on component.

4. FIRST AID MEASURES

Inhalation Provide patient with fresh air and seek medical advice.
Skin Contact Refer to supplier's Safety Data Sheets for specific information on component.
Eye Contact Irrigate thoroughly with water and seek medical advice.
Ingestion Get medical aid immediately.

5. FIREFIGHTING MEASURES

Suitable Extinguishing Media Large volumes of water. Chemical fire extinguisher. Sand.
Specific Hazards From Combustion Refer to supplier's Safety Data Sheets for specific information on component.
Personal Protection Use air-ventilated full mask and full protective clothing.

6. ACCIDENTAL RELEASE MEASURES

Hazardous materials are contained in sealed units within the life vest. Spills should pose no threat if sealed units are not breached. If compressed gas cylinder may discharge or rupture, ventilate the area. Refer to supplier's Safety Data Sheets for specific information on component.

7. HANDLING AND STORAGE

Handle the life vest with care. These units should be stored in a cool and dry area away from danger of sparks, heat or flame. Do not pull the inflation tab on the vest. Opening the package and unpacking the vest may cause it to inflate. Life vest can cause injury if inflated close to people or in a confined area. Prolonged exposure to moisture may cause water activated lights on some vests to discharge and give off a non-hazardous "rotten egg" smell. Fully ventilate the area. On vest models equipped with water activated inflation systems, prolonged exposure to moisture can cause the vest to inflate by itself. Refer to supplier's Safety Data Sheets for specific information on component.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

N/A. Refer to supplier's Safety Data Sheets for specific information on component.

9. PHYSICAL AND CHEMICAL PROPERTIES

Refer to supplier's Safety Data Sheets for specific information on component.

10. STABILITY AND REACTIVITY

The life vest is stable if stored in the original package in cool and dry conditions. Do not subject life vest to high temperatures or excessively humid conditions. Refer to supplier's Safety Data Sheets for specific information on component.

11. TOXICOLOGICAL INFORMATION

N/A. Refer to supplier's Safety Data Sheets for specific information on component.

12. ECOLOGICAL INFORMATION

N/A. Refer to supplier's Safety Data Sheets for specific information on component.

13. DISPOSAL CONSIDERATIONS

Refer to supplier's Safety Data Sheets for specific disposal information of component. Other solid contents may be disposed of as domestic waste in accordance with local laws and regulations.

14. TRANSPORT INFORMATION

	Max Gross Weight ≤ 40Kg	**Max Gross Weight > 40Kg**
UN Number	N/A	UN2990. Declare as Dangerous Goods.
UN Proper Shipping Name	Life Saving Appliance, Self-Inflating	
Transport Hazard Class(es)	N/A	Class 9
Packing Group	N/A	
Other	Reference IATA packing instructions 955.	

15. REGULATORY INFORMATION

N/A. Refer to supplier's Safety Data Sheets for specific information on components.

16. OTHER INFORMATION

Revision Level	Original
Other	Supplier's Safety Data Sheets can be found on our website at www.eamworldwide.com/technical-data/

iSi Components Material Safety Data Sheet

1. Chemical Product and Company Identification

Product Name: Carbon dioxide (compressed)	**Trade Name:** Carbon dioxide
Chemical Name: Carbon dioxide	**Synonyms:** Carbonic anhydride, carbonic acid gas
Formula: CO_2	**Chemical Family:** Acid anhydrides
Telephone: **Emergencies:** 1-800-424-9300* **Routine:** 1-973-227-2426*	**Company Name:** ***iSi North America, Inc.*** 175 Route 46 West Fairfield, NJ 07004

** Call emergency numbers 24 hours a day only for spills, leaks, fire, exposure, or accidents involving this product. For routine information, contact iSi Components or call the number above.*

2. Composition/Information on Ingredients

Carbon dioxide is supplied in cylinders as a liquid under its own vapor pressure, which varies depending on the temperature. It is non-toxic, non-flammable and heavier than air. Cylinders range in size from 10 ml. to 350 ml.

INGREDIENT	CAS NUMBER	CONCENTRATION	OSHA PEL	ACGIH TLV-TWA
Carbon Dioxide	124-38-9	>99%	5,000 ppm*	5,000 ppm**

** The symbol > means "greater than"; the symbol <, "less than."*
*** See following section.*

3. Hazards Identification

EMERGENCY OVERVIEW

CAUTION! High-pressure liquid and gas.
Can cause rapid suffocation.
Can increase respiration and heart rate.
May cause nervous system damage.
May cause frostbite.
May cause dizziness and drowsiness.
Self-contained breathing apparatus may be required by rescue workers.
Odor: None to slightly pungent

THRESHOLD LIMIT VALUE: TLV-TWA, 5,000 ppm (ACGIH, 1998). TLV-TWA, 15 min STEL, 30,000 ppm.

EFFECTS OF A SINGLE (ACUTE) OVEREXPOSURE:

INHALATION–Carbon dioxide gas is an asphyxiant with effects due to lack of oxygen. It is also physiologically active, affecting circulation and breathing. Moderate concentrations may cause headache, drowsiness, dizziness, stinging of the nose and throat, excitation, rapid breathing and heart rate, excess salivation, vomiting, and unconsciousness. Lack of oxygen can kill.

SKIN CONTACT–No harm expected from vapor. Cold gas, or liquid or solid carbon dioxide may cause severe frostbite.

SWALLOWING–An unlikely route of exposure. This product is a gas at normal temperature and pressure.

EYE CONTACT–No harm expected from vapor. Cold gas, or liquid or solid carbon dioxide may cause severe frostbite.

EFFECTS OF REPEATED (CHRONIC) OVEREXPOSURE: No harm expected.

OTHER EFFECTS OF OVEREXPOSURE: Damage to retinal or ganglion cells and central nervous system may occur.

MEDICAL CONDITIONS AGGRAVATED BY OVEREXPOSURE: The toxicology and the physical and chemical properties of carbon dioxide suggest that overexposure is unlikely to aggravate existing medical conditions.

SIGNIFICANT LABORATORY DATA WITH POSSIBLE RELEVANCE TO HUMAN HEALTH HAZARD EVALUATION: A single study has shown an increase in heart defects in rats exposed to 6% carbon dioxide in air for 24 hours at different times during gestation. There is no evidence that carbon dioxide is teratogenic in humans.

CARCINOGENICITY: Carbon dioxide is not listed by NTP, OSHA, or IARC.

4. First Aid Measures

INHALATION: Immediately remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, qualified personnel may give oxygen. Call a physician.

SKIN CONTACT: For exposure to cold vapor or solid, immediately warm frostbite area with warm water not to exceed 105°F (41°C). In case of massive exposure, remove contaminated clothing while showering with warm water. Call a physician.

SWALLOWING: An unlikely route of exposure. This product is a gas at normal temperature and pressure.

EYE CONTACT: For exposure to cold vapor or solid, immediately flush eyes thoroughly with warm water for at least 15 minutes. Hold the eyelids open and away from the eyeballs to ensure that all surfaces are flushed thoroughly. See a physician, preferably an ophthalmologist, immediately.

NOTES TO PHYSICIAN**:** *There is no specific antidote. Treatment of overexposure should be directed at the control of symptoms and the clinical condition of the patient.*

5. Fire Fighting Measures

FLASH POINT (test method)	Not applicable	**AUTOIGNITION TEMPERATURE**	Not applicable	
FLAMMABLE LIMITS IN AIR, % by volume	**LOWER**	Not applicable	**UPPER**	Not applicable

EXTINGUISHING MEDIA: Carbon dioxide cannot catch fire. Use media appropriate for surrounding fire.

SPECIAL FIRE FIGHTING PROCEDURES: CAUTION! High-pressure gas liquid and gas. Evacuate all personnel from danger area. Immediately deluge cylinders with water from maximum distance until cool, then move them away from fire area if without risk. Self-contained breathing apparatus may be required by rescue workers. On-site fire brigades must comply with OSHA 29 CFR 1910.156.

UNUSUAL FIRE AND EXPLOSION HAZARDS: Heat of fire can build pressure in cylinder and cause it to rupture. **Recommended storage temperature: -30 degrees C to +65 degrees C.**

HAZARDOUS COMBUSTION PRODUCTS: None known.

6. Accidental Release Measures

STEPS TO BE TAKEN IF MATERIAL IS RELEASED OR SPILLED: CAUTION! High-pressure liquid and gas. Carbon dioxide is an asphyxiant. Lack of oxygen can kill. Evacuate all personnel from danger area. Use self-contained breathing apparatus where needed. Shut off leak if you can do so without risk. Ventilate area or move cylinder to a well-ventilated area. Test for sufficient oxygen, especially in confined spaces, before allowing reentry.

WASTE DISPOSAL METHOD: Prevent waste from contaminating the surrounding environment. Keep personnel away. Discard any product, residue, disposable container, or liner in an environmentally acceptable manner, in full compliance with federal, state, and local regulations. If necessary, call your local supplier for assistance.

7. Handling and Storage

PRECAUTIONS TO BE TAKEN IN STORAGE: Store and use with adequate ventilation. If applicable, secure cylinders upright to keep them from falling or being knocked over.

PRECAUTIONS TO BE TAKEN IN HANDLING: Protect cylinders from damage, refer to section 16.

For additional information on storage and handling, refer to Compressed Gas Association (CGA) pamphlet P-1, *Safe Handling of Compressed Gases in Containers*, available from the CGA.

8. Exposure Controls/Personal Protection

VENTILATION/ENGINEERING CONTROLS:

LOCAL EXHAUST–Use a local exhaust system, if necessary, to control the concentration of carbon dioxide in the worker's breathing zone.

MECHANICAL (general)–Under certain conditions, general exhaust ventilation may be acceptable to keep carbon dioxide below the exposure limit.

SPECIAL–None

OTHER–None

RESPIRATORY PROTECTION: None required under normal use. An air-supplied respirator must be used in confined spaces. Respiratory protection must conform to OSHA rules as specified in 29 CFR 1910.134.

SKIN PROTECTION: Wear insulated neoprene gloves for cylinder handling

EYE PROTECTION: Select in accordance with OSHA 29 CFR 1910.133.

OTHER PROTECTIVE EQUIPMENT: Metatarsal shoes for cylinder handling. Select in accordance with OSHA 29 CFR 1910.132 and 1910.133.

9. Physical and Chemical Properties

MOLECULAR WEIGHT:	44.01
SPECIFIC GRAVITY (Air = 1) at 70°F (21.1°C) and 1 atm**:**	1.522
GAS DENSITY at 70°F (21.1°C) and 1 atm**:**	0.1444 lb/ft^3 (1.833 kg/m^3)
LIQUID DENSITY (saturated) at 70°F (21.1°C) and 1 atm**:**	47.6 lb/ft^3 (762 kg/m^3)
VAPOR PRESSURE at 70°F (21.1°C)**:**	838 psig (5778 kPa)
SOLUBILITY IN WATER, vol/vol at 68°F (20°C) and 1 atm**:**	0.90
PERCENT VOLATILES BY VOLUME:	100
EVAPORATION RATE (Butyl Acetate = 1)**:**	High
pH:	3.7 (for carbonic acid)
SUBLIMATION POINT at 1 atm**:**	-109.3°F (-78.5°C)

APPEARANCE, ODOR, AND STATE: Colorless, odorless, slightly acid gas. It is felt by some to have a slight, pungent odor and biting taste.

10. Stability and Reactivity

STABILITY: ☐ **Unstable** ☒ **Stable**

INCOMPATIBILITY (materials to avoid): Alkali metals, alkaline earth metals, metal acetylides, chromium, titanium above 1022°F (550°C), uranium above 1382°F (750°C), magnesium above 1427°F (775°C)

HAZARDOUS DECOMPOSITION PRODUCTS: Electrical discharges and high temperatures decompose carbon dioxide into carbon monoxide and oxygen.

HAZARDOUS POLYMERIZATION: ☐ **May Occur** ☒ **Will Not Occur**

CONDITIONS TO AVOID: None known.

11. Toxicological Information

Carbon dioxide is an asphyxiant. It initially stimulates respiration and then causes respiratory depression. High concentrations result in narcosis. Symptoms in humans are as follows:

EFFECT:	CONCENTRATION:
Breathing rate increases slightly.	1%
Breathing rate increases to 50% above normal level. Prolonged exposure can cause headache, tiredness.	2%
Breathing increases to twice normal rate and becomes labored. Weak narcotic effect. Impaired hearing, headache, increased blood pressure and pulse rate.	3%
Breathing increases to approximately four times normal rate, symptoms of intoxication become evident, and slight choking may be felt.	4 - 5%
Characteristic sharp odor noticeable. Very labored breathing, headache, visual impairment, and ringing in the ears. Judgment may be impaired, followed within minutes by loss of consciousness.	5 - 10%
Unconsciousness occurs more rapidly above 10% level. Prolonged exposure to high concentrations may eventually result in death from asphyxiation.	50 - 100%

12. Ecological Information

No adverse ecological effects expected. Carbon dioxide does not contain any Class I or Class II ozone-depleting chemicals. Carbon dioxide is not listed as a marine pollutant by DOT.

13. Disposal Considerations

Empty cylinders prior to disposal. Cylinder shells are 100% recyclable steel.

14. Transport Information

DOT/IMO SHIPPING NAME:	Carbon dioxide				
HAZARD CLASS:	2.2	**IDENTIFICATION NUMBER:**	UN 1013	**PRODUCT RQ:**	Not applicable
SHIPPING LABEL(s):	NONFLAMMABLE GAS				
PLACARD (when required):	NONFLAMMABLE GAS				

SPECIAL SHIPPING INFORMATION: Cylinders should be transported in a secure position, in a well-ventilated vehicle. Cylinders transported in an enclosed, nonventilated compartment of a vehicle can present serious safety hazards.

Shipment of compressed gas cylinders that have been filled without the owner's consent is a violation of federal law [49 CFR 173.301(b)].

15. Regulatory Information

The following selected regulatory requirements may apply to this product. Not all such requirements are identified. Users of this product are solely responsible for compliance with all applicable federal, state, and local regulations.

U.S. FEDERAL REGULATIONS:

EPA (ENVIRONMENTAL PROTECTION AGENCY)

CERCLA: COMPREHENSIVE ENVIRONMENTAL RESPONSE, COMPENSATION, AND LIABILITY ACT OF 1980 (40 CFR Parts 117 and 302):

Reportable Quantity (RQ): None

SARA: SUPERFUND AMENDMENT AND REAUTHORIZATION ACT:

SECTIONS 302/304: Require emergency planning based on Threshold Planning Quantity (TPQ) and release reporting based on Reportable Quantities (RQ) of extremely hazardous substances (40 CFR Part 355):

Threshold Planning Quantity (TPQ): None
Extremely Hazardous Substances (40 CFR 355): None

SECTIONS 311/312: Require submission of MSDSs and reporting of chemical inventories with identification of EPA hazard categories. The hazard categories for this product are as follows:

IMMEDIATE: Yes **PRESSURE:** Yes
DELAYED: No **REACTIVITY:** No
FIRE: No

SECTION 313: Requires submission of annual reports of release of toxic chemicals that appear in 40 CFR Part 372.

Carbon dioxide does not require reporting under Section 313.

40 CFR 68: RISK MANAGEMENT PROGRAM FOR CHEMICAL ACCIDENTAL RELEASE PREVENTION: Requires development and implementation of risk management programs at facilities that manufacture, use, store, or otherwise handle regulated substances in quantities that exceed specified thresholds.

Carbon dioxide is not listed as a regulated substance.

TSCA: TOXIC SUBSTANCES CONTROL ACT: Carbon dioxide is listed on the TSCA inventory.

OSHA: OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION**:**

29 CFR 1910.119: PROCESS SAFETY MANAGEMENT OF HIGHLY HAZARDOUS CHEMICALS: Requires facilities to develop a process safety management program based on Threshold Quantities (TQ) of highly hazardous chemicals.

Carbon dioxide is not listed in Appendix A as a highly hazardous chemical.

STATE REGULATIONS:

CALIFORNIA: Carbon dioxide is not listed by California under the SAFE DRINKING WATER AND TOXIC ENFORCEMENT ACT OF 1986 (Proposition 65).).

WARNING: The combustion of this gas produces carbon monoxide—a chemical known to the State of California to cause birth defects or other reproductive harm.

(California Health and Safety Code §25249.5.)

PENNSYLVANIA: Carbon dioxide is subject to the PENNSYLVANIA WORKER AND COMMUNITY RIGHT-TO-KNOW ACT (35 P.S. Sections 7301-7320).

16. Other Information

HAZARD RATING SYSTEMS:

- **NFPA RATINGS:** **HMIS RATINGS:**

HEALTH	= 1	HEALTH	= 0
FLAMMABILITY	= 0	FLAMMABILITY	= 0
REACTIVITY	= 0	REACTIVITY	= 0
SPECIAL	= SA	(CGA recommends this to designate Simple Asphyxiant)	

1. Identification

Product Identifiner	:	Carbon Dioxide
Other means of identification	:	Carbonic, Carbon Dioxide, Carbonic Anhydride, CO2, UN 1013
Product use	:	Synthetic, Analytical chemistry
Supplier	:	Leland Limited, Inc. 2614 South Clinton Ave. South Plainfield, NJ 07080 1-908-668-1008 (9-5 EST)
Emergency calls (CHEMTREC)	:	1-800-424-9300 (Domestic) 1-703-527-3887 (International)

2. Hazards Identification

OSHA/HCS status	:	This material is considered hazardous by the OSHA Hazard Communication Standard (29 CFR 1910. 1200).
Classification of the substance or mixture	:	Gases under pressure – Liquefied gas Simple asphyxiant

<u>GHS label elements</u>

Hazard pictograms :

Signal word	:	Warning
Hazards statements	:	Contains gas under pressure; may explode if heated May cause frostbite May displace oxygen and cause rapid suffocation May increase respiration and heart rate

<u>Precautionary statements</u>

General	:	Read and follow all Safety Data Sheets (SDS'S) before use. Read label before use. Keep out of reach of children. If medical advice is needed, have product container or label at hand. Close valve after each use and when empty. Use equipment rated for cylinder pressure. Do not open valve until connected to equipment prepared for use. Use a back flow preventative device in the piping. Use only equipment of compatible materials of construction. Always keep container in upright position.
Prevention	:	Use and store outdoors or in a well ventilated place.
Response	:	IF INHALED: Remove person to fresh air and keep comfortable for breathing. Call a POISON CENTER or doctor/physician if you feel unwell.
Storage	:	Protect from sunlight. Protect from sunlight when ambient temperature exceeds 52C/125F. Store in a well-ventilated place.
Disposal	:	Dispose in accordance with all applicable regulations.
Hazards not otherwise classified	:	In addition to any other important health or physical hazards, this product may displace oxygen and cause rapid suffocation. May cause frostbite.

3. Composition, Information on Ingredients

Substance/Mixture	:	Substance
Chemical Name	:	Carbon dioxide
Synonyms	:	Carbonic, Carbon Dioxide, Carbon Anhydride, CO2
CAS Number	:	124-38-9
Content (vo%)	:	99.5 % or more

There are no additional ingredients present which, within the current knowledge of the supplier and in the concentrations applicable, are classified as hazardous to health or the environment and hence require reporting in this section.

Occupational exposure limits, if available, are listed in Section 8.

4. First Aid Measures

Description of necessary first aid measures

Inhalation	:	Remove exposed person to fresh air and keep at rest in a position comfortable for breathing. If not breathing, if breathing is irregular, or if respiratory arrest occurs, provide artificial respiration or oxygen by trained personnel. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation. Get medical attention if adverse health effects persist or are severe. If unconscious, place in recovery position and get medical attention immediately. Maintain an open airway. Loosen tight clothing such as a collar, tie, belt or waistband.
Skin Contact	:	Carbon dioxide is harmless at atmospheric pressure. Flush contaminated skin with plenty of water. Remove contaminated clothing and shoes. Get medical attention if symptoms occur. Wash clothing before reuse. Clean shoes thoroughly before reuse.
Eye Contact	:	Carbon dioxide is harmless at atmospheric pressure. Immediately flush eyes with plenty of water, occasionally lifting the upper and lower eyelids. Check for and remove any contact lenses. Continue to rinse for at least 10 minutes. Get medical attention if irritation occurs.
Ingestion	:	Since this product is a gas, refer to the inhalation section.

Most important symptoms/effects, acute and delayed

Potential acute health effects

Inhalation	:	No known significant effects or critical hazards.
Skin Contact	:	No known significant effects or critical hazards.
Eye Contact	:	No known significant effects or critical hazards.
Frostbite	:	Try to warm up the frozen tissues and seek medical attention.
Ingestion	:	As this product is a gas, refer to the inhalation section.

Over-exposure signs/symptoms

Inhalation	:	No specific data.
Skin Contact	:	No specific data.
Eye Contact	:	No specific data.
Ingestion	:	No specific data.

Indication of immediate medical attention and special treatment needed, if necessary

Notes to physician	:	Treat symptomatically. Contact poison treatment specialist immediately if large quantities have been ingested or inhaled.
Specific treatments	:	No specific treatment.
Protection of first-aiders	:	No action shall be taken involving any personal risk or without suitable training. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation.

5. Fire Fighting Measures

Extinguishing media

Suitable extinguishing media	:	Use an extinguishing agent suitable for the surrounding fire.
Unsuitable extinguishing media	:	None known.
Specific hazards arising from the chemical	:	Contains gas under pressure. In a fire or if heated, a pressure increase will occur and the container may burst or explode.
Hazardous thermal decomposition products	:	Decomposition products may include the following materials: Carbon dioxide Carbon monoxide
Special protective actions for fire-fighters	:	Promptly isolate the scene by removing all persons from the vicinity of the incident if there is a fire. No action shall be taken involving any personal risk or without suitable training. Contact supplier immediately for specialist advice. Move containers from fire area if this can be done without risk. Use water spray to keep fire-exposed containers cool.
Special protective equipment for fire-fighters		Fire-fighters should wear appropriate equipment and self-contained breathing apparatus (SCBA) with a full face-piece operated in positive pressure mode.

6. Accidental Release Measures

Personal precautions, protective equipment and emergency procedures

For non-emergency personnel	:	No action shall be taken involving any personal risk or without suitable training. Evacuate surrounding areas. Keep unnecessary and unprotected personnel from entering. Avoid breathing gas. Provide adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Put on appropriate personal protective equipment.
For emergency responders	:	If specialized clothing is required to deal with the spillage, take note of any information in Section 8 on suitable and unsuitable materials. See also the information in “For non-emergency personnel”.
Environmental precautions	:	Ensure emergency procedures to deal with accidental gas releases are in place to avoid contamination of the environment. Inform the relevant authorities if the product has caused environmental pollution (sewers, waterways, soil or air).

Methods and materials for containment and cleaning up

Small spill	:	Immediately contact emergency personnel. Stop leak if without risk.
Large spill	:	Immediately contact emergency personnel. Stop leak if without risk. Note: see Section 1 for emergency contact information and Section 13 for waste disposal.

7. Handling and Storage

Precautions for safe handling

Protective measures	:	Put on appropriate personal protective equipment (see Section 8). Contains gas under pressure. Avoid contact with eyes, skin and clothing. Avoid breathing gas. Empty containers retain product residue and can be hazardous. Do not puncture or incinerate container. Use equipment rated for cylinder pressure. Close valve after each use and when empty. Protect cylinders from physical damage; do not drag, roll, slide, or drop. Use a suitable hand truck for cylinder movement.
Advice on general occupational hygiene	:	Eating, drinking and smoking should be prohibited in areas where this material is handled, stored and processed. Workers should wash hands and face before eating, drinking and smoking. Remove contaminated clothing and protective equipment before entering eating areas. See also Section 8 for additional information on hygiene measures.
Conditions for safe storage, including any incompatibilities	:	Store in accordance with local regulations. Store in a segregated and approved area. Store away from direct sunlight in a dry, cool and well-ventilated area, away from incompatible materials (see Section 10). Keep container tightly closed and sealed until ready for use. Cylinders should be stored upright, with valve protection cap in place, and firmly secured to prevent falling or being knocked over. Cylinder temperatures should not exceed 52C (125F).

8. Exposure Controls and Personal Protection

Control parameters

Occupational exposure limits

Ingredient name	Exposure limits
Carbon Dioxide	ACGIH TLV (United States, 3/2012). Oxygen Depletion [Asphyxiant]. STEL: 54000 mg/m^3 15 minutes. STEL: 30000 ppm 15 minutes. TWA: 9000 mg/m^3 8 hours TWA: 5000 ppm 8 hours. NIOSH REL (United States, 1/2013). STEL: 54000 mg/m^3 15 minutes. STEL: 30000 ppm 15 minutes. TWA: 9000 mg/m^3 8 hours TWA: 5000 ppm 8 hours. OSHA PEL (United States, 6/2010). TWA: 9000 mg/m^3 8 hours TWA: 5000 ppm 8 hours.

	OSHA PEL 1989 (United States, 3/1989). STEL: 54000 mg/m^3 15 minutes. STEL: 30000 ppm 15 minutes. TWA: 9000 mg/m^3 8 hours TWA: 5000 ppm 8 hours.

Appropriate engineering controls : Good general ventilation should be sufficient to control worker exposure to airborne contaminants.

Environmental exposure control : Emissions from ventilation or work process equipment should be checked to ensure they comply with the requirements of environmental protection legislation. In some cases, fume scrubbers, filters or engineering modifications to the process equipment will be necessary to reduce emissions to acceptable levels.

Individual protection measures

Hygiene measures : Wash hands, forearms and face thoroughly after handling chemical products, before eating, smoking, using the lavatory and at the end of your shift.
Appropriate techniques should be used to remove potentially contaminated clothing. Wash contaminated clothing before reusing.
Ensure that eyewash stations and safety showers are close to the workstation location.

Eye/Face protection : Safety eyewear complying with an approved standard should be used when a risk assessment indicates this is necessary to avoid exposure to liquid splashes, mists, gases or dusts. If contact is possible, the following protection should be worn, unless the assessment indicates a higher degree of protection: safety glasses with side-shields.

Skin protection

Hand protection : Chemical-resistant, impervious gloves complying with an approved standard should be worn at all times when handling chemical products if a risk assessment indicates this is necessary. Considering the parameters specified by the glove manufacturer, check during use that the gloves are still retaining their protective properties. It should be noted that the time to breakthrough for any glove material may be different for different glove manufacturers. In the case of mixtures, consisting of several substances, the protection time of the gloves cannot be accurately estimated.

Body protection : Personal protective equipment for the body should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product.

Other skin protection : Appropriate footwear and any additional skin protection measures should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product.

Respiratory protection : Use a properly fitted, air-purifying or air-fed respirator complying with an approved standard if a risk assessment indicates this is necessary.

Respirator selection must be based on known or anticipated exposure levels, the hazards of the product and the safe working limits of the selected respirator.

9. Physical and Chemical Properties

Appearance

Physical state	:	Gas at normal temperature and pressure
Color	:	Colorless
Molecular weight	:	44.01 g/mol
Molecular formula	:	$C\text{-}O_2$
Melting/freezing point	:	Sublimation temperature: -79C (-110.2F)
Critical temperature	:	30.85C (87.5F)
Odor	:	Odorless
Odor threshold	:	Not available.
pH	:	Not available.
Flash point	:	[Product does not sustain combustion.]
Burning time	:	Not applicable.
Burning rate	:	Not applicable.
Evaporation rate	:	Not available.
Flammability (solid, gas)	:	Not available.
Lower and upper explosive (flammable) limits	:	Not available.
Vapor pressure	:	830 psig
Vapor density	:	1.53 (Air = 1), Liquid Density@BP: Solid Density = 97.5 lb/ft^3 (1562 kg/m^3)
Specific Volume	:	8.7719 ft^3/lb (m^3/g)
Gas Density	:	0.114 lb/ft^3 (178.6 g/m^3)
Relative density	:	Not applicable.
Solubility	:	Not available.
Solubility in Water	:	Not available.
Partition coefficient: n-octanol/water	:	0.83
Auto-ignition temperature	:	Not available.
Decomposition temperature	:	Not available.
SADT	:	Not available.
Viscosity	:	Not applicable.

10. Stability and Reactivity

Reactivity	:	No specific test data related to reactivity is available for this product or its ingredients.
Chemical stability	:	The product is stable.
Possibility of hazardous reactions	:	Under normal conditions of storage and use, hazardous reactions will not occur.
Conditions to avoid	:	No specific data.
Hazardous decomposition	:	Under normal conditions of storage and use, hazardous decomposition

products		products should not be produced.
Hazardous polymerization	:	Under normal conditions of storage and use, hazardous polymerization will not occur.

11. Toxicological Information

Information on toxicological effects

Acute toxicity	:	Not available.
Irritation / Corrosion	:	Not available.
Sensitization	:	Not available.
Mutagenicity	:	Not available.
Carcinogenicity	:	Not available.
Reproductive toxicity	:	Not available.
Teratogenicity	:	Not available.
Specific target organ toxicity (single exposure)	:	Not available.
Specific target organ toxicity (repeated exposure)	:	Not available.
Aspiration hazard	:	Not available.
Information on the likely routes of exposure	:	Not available.

Potential acute health effects

Eye contact	:	No known significant effects or critical hazards.
Inhalation	:	No known significant effects or critical hazards.
Skin contact	:	No known significant effects or critical hazards.
Ingestion	:	Since this product is a gas, refer to the inhalation section.

Symptoms related to the physical, chemical and toxicological characteristics

Eye contact	:	No specific data.
Inhalation	:	No specific data.
Skin contact	:	No specific data.
ingestion	:	No specific data.

Delayed and immediate effects and also chronic effects from short and long term exposure

Short term exposure

Potential immediate effects	:	Not available.
Potential delayed effects	:	Not available.

Long term exposure

Potential immediate effects	:	Not available.
Potential delayed effects	:	Not available.

Potential chronic health effects – Not available.

General	:	No known significant effects or critical hazards.
Carcinogenicity	:	No known significant effects or critical hazards.
Mutagenicity	:	No known significant effects or critical hazards.
Teratogenicity	:	No known significant effects or critical hazards.
Developmental effects		No known significant effects or critical hazards.

Fertility effects No known significant effects or critical hazards.

Numerical measures of toxicity
Acute toxicity estimates : Not available.

12. Ecological Information

Toxicity : Not available.
Persistence and degradability : Not available.

Bioaccumulative potential

Product/Ingredient name	Log P_{ow}	BCF	Potential
Carbon Dioxide	0.83	-	low

Mobility is soil
Soil/Water partition coefficient (K_{OC}) : Not available.
Other adverse effects : No known significant effects or critical hazards.

13. Disposal Considerations

Discharge of Carbon Dioxide Gradually release in open air.
Disposal of Cylinders : If gas remains in cylinders, release gas with proper equipment and dispose of cylinders as incombustible waste.
For empty cylinders, check for a puncture hole and dispose of as incombustible waste.
Do not dispose of cylinders without first checking that all gas has been released.

14. Transport Information

DOT / IMDG Shipping Name : Carbon Dioxide
UN Number : UN 1013
Hazard Class : 2.2
Placard (When required) : Nonflammable gas

Special Shipping Information : See CFR 49, 172.101, 173.306 for exceptions of labeling.

15. Regulatory Information

The following selected regulatory requirements may apply to this product. Not all such requirements are identified. Users of this product are solely responsible for compliance with all applicable federal, state, and local regulations.

U.S. Federal Regulations	:	None of this products components are listed under SARA Sections 302/304 (40 CFR 355 Appendix A), SARA Section 313 (40 CFR 372.65), CERCLA (40 CFR 302.4), TSCA 12(b), or require an OSHA process safety plan.		
SARA 311/312 Hazardous Categories	:	Fire hazard	:	No
		Sudden release of pressure	:	Yes
		Reactive	:	No
		Immediate (acute) health hazard	:	No
		Delayed (chronic) health hazard	:	No
State Regulations	:	Massachusetts	:	This material is listed.
		New York	:	This material is not listed.
		New Jersey	:	This material is listed.
		Pennsylvania	:	This material is listed.
		California	:	This material is listed. Not regulated under CA Proposition 65.
International Regulations	:	Canada inventory		This material is listed or exempted.
		Australia inventory (AICS)		This material is listed or exempted.
		China inventory (IECSC)		This material is listed or exempted.
		Japan inventory		This material is listed or exempted.
		Korea inventory		This material is listed or exempted.
		Malaysia inventory (EHS Register)		Not determined.
		New Zealand inventory of Chemicals (NZIoC)		This material is listed or exempted.
		Philippines inventory (PICCS)		This material is listed or exempted.
		Taiwan inventory (CSNN)		Not determined.

16. Other Information

Hazard Rating Systems	:	**NFPA Ratings**	**HMIS Ratings**
		Health = 2	Health = 1
		Flammability = 0	Flammability = 0
		Reactivity = 0	Physical hazards = 3
		Special = SA	

Key to abbreviations

ACGIH	:	American Conference of Governmental Industrial Hygienists
BCF	:	Bioconcentration Factor
CAS	:	Chemical Abstract Services
CERCLA	:	Comprehensive Environmental Response, Compensation, and Liability Act
CFR	:	United States Code of Federal Regulations

DOT	:	Department of Transportation
GHS	:	Globally Harmonized System of Classification and Labeling of Chemicals
IATA	:	International Air Transport Association
IMDG	:	International Maritime Dangerous Goods
Log P_{ow}	:	Logarithm of the octanol/water partition coefficient
NIOSH	:	National Institute for Occupational Safety and Health
OSHA	:	Occupational Safety and Health Administration
STEL	:	Short-term Exposure Limit
SARA	:	Superfund Amendments and Reauthorization Act
TLV	:	Threshold Limit Value
TSCA	:	Toxic Substances Control Act
TWA	:	Time Weighted Average

Notice to reader:
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Final determination of suitability of any material is the sole responsibility of the user. All materials may present unknown hazards and should be used with caution. Although certain hazards are described herein, we cannot guarantee they are the only hazards that exist.